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ABSTRACT

This report describes a data management process that provides users with a systematic approach to document identification, and to information storage and retrieval using the AppleWorks database subprogram and a simple organizational scheme. The functions of this scheme are described and include: (1) taking the user from general to specific information on documents the user has stored; (2) accounting for the storage of start-up programs and data disks; (3) providing built-in redundancy to protect the user against the possibility of document loss; (4) greatly reducing document retrieval time; and (5) offering several hundred different information access codes for use in document file searches. How this management approach can be developed is illustrated through a description of, and an explanation of how each component works in the information storage and access system. It is suggested that users try this system if their current document identification and subsequent retrieval system is not working at the optimum for them. (CGD)

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SCIENCE INFORMATION STORAGE AND ACCESS

DATA MANAGEMENT USING APPLEWORKS

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INTRODUCTION

"Garbage in, garbage out," is an old saying in the computer world. The statement reveals something intrinsically basic about the machines which now pervade every aspect of life. Computers provide no more information than they are given. The quality of that information relates directly to the quality of the information the user receives when the computer is queried. Let's look at these statements as they relate to the management of word processor, data base, and spreadsheet files.

Today, everyone speaks in Acronese! We have ASVABS, TELCONS, LORSTAS, PIREPS, LTRS, and infinitely more. When we can't find a known acronym, we invent one to fit the situation. Everybody at one time or another becomes the designer of one or more new acronyms which, of course, all future readers as well as the designer will immediately recognize and subsequently understand! Who could possibly mistake ROBLTR for a letter written sometime ago to Robert or was it Roberta.

Recently, a student asked if I would help locate a critically important scientific document. The task would be "easy" since it was stored in a file on one of four double sided floppy data disks, and all of the files were AppleWorks files. The task would be further simplified because friendly old AppleWorks alphabetizes all file names. We examined side one of the first disk, upon which as it turned out were stored 27 files. The process used to name the files was a wonderful exercise in language development. How creative my student was! In addition to many acronyms, the definitions of which eluded us both, there were files named "a, aa, aaa" and so on. The only thing I could guess here was that "a" probably predated "aa." We, therefore, were forced to examine almost all of the 27 files as we searched for the one that was needed.

You guessed it! The document we sought was finally located 87 files and three disks later. To overcome my limited fluency with my students language and his inability to remember his own language, we called up and examined 70 of the files preceding the important one. Alas, we were successful and after only two and a half hours of searching at that! There had to be a better way! A helpful procedure is what you need, instead of purchasing an expensive library program for your computer!

PRESENTATION

Word processor, data base, and spreadsheet documents may be stored randomly, identified and retrieved rapidly using the AppleWorks data base subprogram and a simple organizational scheme. The scheme I have used successfully for a number of years takes me from general to specific information regarding documents I have stored, accounts for storage of startup program and data disks, provides built-in redundancy to protect me against the possibility of missing the critical file in a document search, provides several hundred different information access codes for use in document file searches and uses the AppleWorks data base subprogram. Figure 1 is a block diagram of the "Information Storage and Access System." Figure 1 provides a flow diagram one uses to proceed through the system if he or she starts from scratch, not knowing on which disk document library information is stored.

The Apple computer was chosen for use because of the great number of science programs available for use with this it as well as the ease with which AppleWorks can be integrated into any kindergarten through college science program.

Insert Figure 1 About Here

Master Disk. The "Master Disk" is the focal point of the system. As the most general part of the scheme, it is the point where one enters in search of a stored file, and the point where one begins when a new word processor, data base, or spreadsheet document is to be created and subsequently stored. The "Master Disk" includes one or more data base files in which every disk in the system is described generally (see Figure 2). A file of 240 records uses approximately 40K bytes and the desktop capacity of the Apple IIe computer is 55K, while the expanded desktop capability of the Apple IIGS computer allows the use of much larger storage files.

Insert Figure 2 About Here

Each disk is numbered. I use six digits to distinguish disk numbers from file numbers. The numbers begin with 000001 and proceed successively. Every disk I use receives a

number. This includes Startup and Program disks as well as data disks.

At present, two of the computer systems I use have disk drives with dual read heads (NCR and Zenith) while one has a single head (Apple - depends upon whether it is the IIe or IIGS). Not only must a disk used with the single head system be formatted on both sides but, may need to be turned over depending upon which side is to be used. In this case, the general type(s) of information stored on sides one and two are entered in their respective locations. If a single disk or a system like the NCR which automatically enters information on both sides of the disk is used, a corresponding entry is made in the "Side 2" category.

The storage location of each disk is entered. At present I use four-digit numbers, the first being 0001 and each successive box has a number, one greater than the previous box. This allows one to have 9,999 storage sites or boxes. If you use "Flip-N-File" boxes as I do, 99,990 disks may be stored before number space is exhausted. That's a lot of room if your operating a small science department, but perhaps not so much if you happen to be a university research librarian.

The date I start to store files on a disk as well as the date the storage capacity is used up are also included. With startup and program disks, the program publication date and or version might be entered here. AppleWorks, for example is out in versions 1.2 and 1.3 having different publication dates.

LIBRARY DESCRIPTION DISK. The number(s) and storage location(s) for this disk(s) is(are) retrieved from the "Master Disk." Files on this disk, as before, are constructed using the AppleWorks data base subprogram. Each document library is described here using six categories. The numbering scheme here uses three digits. The first library is numbered 001. Successive libraries take on successive numbers. Accordingly, one could build 999 document libraries (each library description is one record in the data base library file). If each library includes 300 document file records (each file is a record describing a document stored in a particular file), storage capacity here then is 330,700 document records. The number of the disk on which the library is stored, disk side number, document type (word processor, data base, spreadsheets, lesson plans, letters etc), date the library file was opened (date the record of the first file was entered) and date the library was closed (last record entered) are also included

for each library. A typical record of a library file is shown in Figure 3. Note the redundancy of information here

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Insert Figure 3 About Here

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and that included in the "Master Disk" files (DISK NO:).

LIBRARY DISK. Information in the records of the "Library Description" disk direct me to a specific library file on a specific disk (by number). Each file stored in the system has a record in one of the library files. These files are also constructed using the AppleWorks data base subprogram. Each record (see Figure 4) includes ten categories of information. Documents are numbered successively from 00001

Insert Figure 4 Here

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to the end, allowing for the inclusion of 99,999 document files. As you can see, the use of five digits sets the system limit. The system could be expanded correspondingly by using a seven instead of a five digit number field here. Since my system includes only word processor (WP), data base (DB) and spreadsheet (SS) files, entries in the second category, "DOC TYPE," are limited to WP, DB or SS.

The "DOC. NO" and "DOC. TYPE" categories as well as the library file number are used when naming new files. Information from each of these is used to form an alphanumeric code which becomes the new file name. A new word processor file numbered 00315 and described in library file 002 is identified as WP00315.002. If I scan a disk catalog, I see a list of all files stored on the disk (see Figure 5).

Insert Figure 5 About Here

Without additional information I can identify the document type, its number and the library file in which it is described. It's not necessary for me to call up the file and examine the document, as my student and I did, to learn something about the contents.

"KEYWORD, SUBJECT," and "TITLE" categories are part of a categorization scheme, used by many libraries, in which a

document is labeled more and more specifically, as entries are made to describe a file. The "AUTHOR" is the name of the person who first created the document when the file was first opened. This category is important especially if more than one individual uses the system.

The "DATE" is the date the file was created.

The "DISK NO" is the number of the disk on which the file is stored. Note here also that disk side, if applicable, is included.

Documents may take on a variety of forms especially if they are in word processor files. Examples of some of the identifiers I use are: list, letter, memo, lesson plan, paragraph and so on.

The "USER/RCVR" category is used to indicate the person to whom a letter is sent, who will be the filed document user and the like.

As I depart the library file record, all I must take with me is the eight digit file number. When using AppleWorks' files to store documents, time is saved remembering the document type (WP, DB, SS) since documents are automatically grouped in the disk catalog by type. The catalog is further arranged numerically within the grouping categorization scheme; DB00212.003 is listed before DB00224.003.

DISK CATALOG. The final step (in locating a particular file) is to scan the disk catalog, bringing the desired file to the computer monitor screen. The file of interest should

have an alphanumeric code from the library record file, which as mentioned above, is a marriage of DOC. NO., DOC. TYPE and DOC. FORM information from the library record.

FINDING DOCUMENTS. Now that the documents are all neatly stored in alphanumeric archives individual storage locations must be identified before documents can be retrieved. If you teach three science classes or courses, each meeting three to five times a week during which three new documents are created and stored each class each day, as many as 135 new files could be created each week. Under such circumstances, document location could become very complicated very rapidly. AppleWorks data base, however, provides a record selection process which allows us to search for records using up to three of twelve different (see Figure 6).

INSERT FIGURE 5 ABOUT HERE

When the combinations (364) of 12 variables taken three at a time are integrated with the ten categories found in the document library files there are over 10,000 information combinations or ways by which a single document may be accessed assuming only one word, number or alphanumeric code is included in each category of a document library record. Since the data base program is written such that it scans for and will identify single words, the number of potential access combinations increases dramatically when document titles include more than one word.

SYSTEM QUESTIONS:

1. What's the probability a document cannot be rapidly located using this sytem? Slim!

2. How long does it take to set up such a system? The time it takes to format four disks, and construct the three data base files described above.

3. How long does it take to gain facility accessing your documents? The time period depends upon how often you use the system; that is, the more you use the system the better you become at rapidly locating documents.

4. How long does it take to identify the location of a particular file? Probably not more than 30 seconds, after you have used the system for a while.

SUMMARY

Proper and adequate data management is an important aspect of successful computer use. The data management process described here provides users with a systematic approach to document information storage and retrieval. The system provides easy retrieval using AppleWorks preprogrammed sequences. In addition, this management approach provides built in redundancy to help prevent document loss and/or greatly reduce document retrieval time. If your present document identification and subsequent retrieval method is not working to the optimum for you, why not try this one!

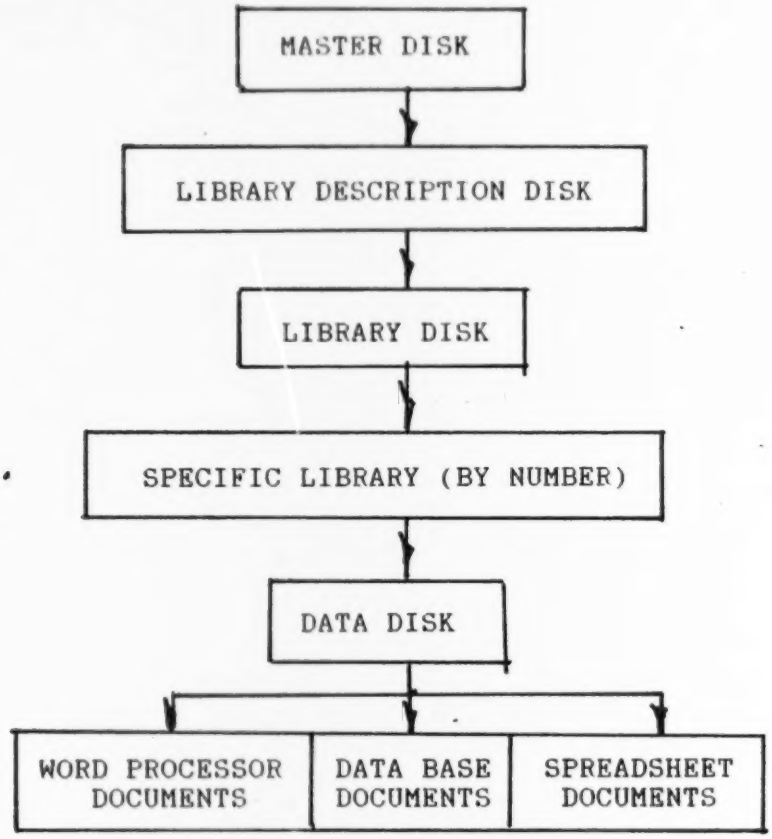

Figure 1. Block Diagram of the "Information Storage and Access System."

```
DISK NO:000012
SIDE 1:LESSON PLANS
SIDE 2:SCIENCE NEWS LETTERS
STORAGE LOC:0005
COMPUTERTYP:APPLE
START DATE:88APR01
COMPLETION DATE:88JUN15
```

Figure 2. Data Base Information Fields for the Master Disk

```
LIBRARY NO:001
DISK NO:000002
SIDE NO:1
TYPE OF DOCS:WP, DB, SS
START DATE:85OCT01
COMPLETION DATE:86APR17
```

Figure 3. Library File Record.

```
DOC. NO:00025
DOC. TYPE:WP
KEY WORD:Inservice
SUBJECT:Elementary Science
TITLE:Workshop Description
AUTHOR:I. M. Informed
DATE:Sep 24 88
DISK NO:000009(Apple Computer) side 1
DOC. FORM:Paragraph
DOC. RCVR/USER:Potential Workshop Participants
```

Figure 4. Document Library File.

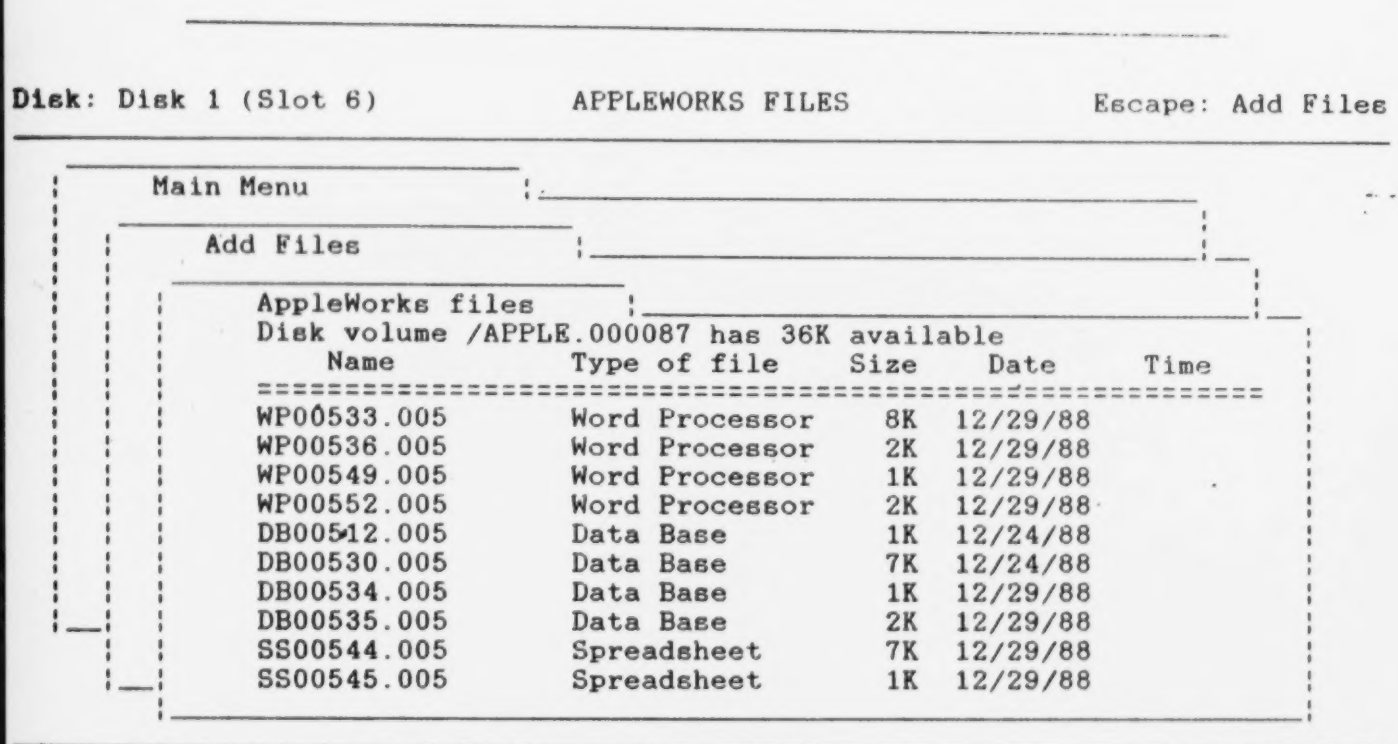

Figure 5. Example of a Disk Catalog.

```
File: BUTTONS                    SELECT RECORDS          Escape: Report Format
Report: BUTTONS.DATA
Selection: COLOR

================================================================================

 1.  equals
 2.  is greater than
 3.  is less than
 4.  is not equal to
 5.  is blank
 6.  is not blank
 7.  contains
 8.  begins with
 9.  ends with
10.  does not contain
11.  does not begin with
12.  does not end with

--------------------------------------------------------------------------------
Type number, or use arrows, then press Return                    18K Avail.
```

Figure 6. AppleWorks Data Base Record Selection Categories.